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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,196	11/20/2001	Chih-Chien Liu	UMC-96-279 CON2	3908
25235	7590	04/19/2006	EXAMINER	
HOGAN & HARTSON LLP ONE TABOR CENTER, SUITE 1500 1200 SEVENTEENTH ST DENVER, CO 80202			SERGEANT, RABON A	
			ART UNIT	PAPER NUMBER
			1711	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/991,196

Applicant(s)

LIU ET AL.

Examiner

Rabon Sergent

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-35 and 37-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-35 and 37-57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. The terminal disclaimer filed on August 17, 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent issuing from U.S. patent application 10/902,315 has been reviewed and is accepted. The terminal disclaimer has been recorded.

2. Claims 45 and 57 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It is not clear that pages 8 and 13 of the specification provide clear and full support for the subject matter of claims 45 and 57. Clarification is required as to how the specification provides support for the claims.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 21-35 and 37-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 8-288285 in view of Tobben et al. ('126).

JP 8-288285 discloses a process for forming wiring line layers on a substrate by etching, wherein the substrate has upon it a wiring line layer, a protection insulating film corresponding to applicants' claimed cap layer (see layer 4 within figures and page 9, lines 1-6 of translation), and a resist mask, corresponding to applicants' claimed mask layer (see layer 6 within figures and page 12, line 18 of translation). The reference further discloses steps wherein the mask layer is patterned, the cap layer is etched according to the mask layer pattern, the mask layer is removed, and the wiring line is etched according to cap layer pattern. See page 12, line 11 through page 14 line 10 of the translation. The reference further discloses that after the wiring lines are formed, a planarized insulating film is applied by bias ECR plasma CVD. See page 14, lines 11-24 of the translation. The position is taken that the disclosed insulating film corresponds to applicants' claimed dielectric material and that in the course of applying the planarized film, the gaps between the wiring lines are inherently filled with dielectric material. Furthermore, the reference discloses at page 11, lines 11-16 of the translation that a high density plasma is generated by bias ECR plasma CVD; therefore, this CVD method is considered to meet applicants' claimed high density plasma chemical vapor deposition method. With respect to the cap layer cross section shapes of claims 23-25, these are disclosed within the figures. Lastly, with respect to the triangular cross section of claim 26 and the facet of claims 41 and 42, the position is taken that such cross sectional shapes would have been inherently produced by the

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process, because it follows that a process capable of producing the disclosed trapezoidal shape would also produce similar shapes having angled sides.

5. The primary reference differs from the instant claims primarily in that while the primary reference discloses that an antireflection layer corresponding to applicants' conductive protective layer can be used as a cap layer (see translation paragraphs [0007] and [0045]), the primary reference fails to disclose the use of both the antireflection layer and a cap layer. It is noted that the translation discloses at paragraph [0044] that the invention of the reference is not limited to the embodiments; therefore, the reference is not considered to preclude modifications. Bearing this in mind, the position is taken that semiconductor structures having applicants' claimed layer structure of wiring line layer, conductive protective layer (antireflection layer), and cap layer were known at the time of invention. This position is supported by the teachings of Tobben et al. See figures; column 2, lines 32-46; and column 3, lines 6+. Therefore, the position is taken that it would have been obvious to incorporate the claimed conductive protective layer between the wiring line layer and the cap layer of the primary reference in accordance with the teachings of the secondary reference, so as to realize such advantages as increased protection of the wiring lines conveyed by the use of such a layer.

6. Applicants' arguments with respect to the primary reference teaching away from the use of an antireflection coating have been considered; however, the arguments fail to address the fact that the primary reference specifically teaches that a TiN antireflection coating may be provided. See paragraph [0045] of the translation. In the absence of arguments adequately rebutting this teaching, there is no justification for removing the prior art rejection. With respect to claims 41, 49, and 53, it is noted that the reference teaches the use of inductively coupled plasma CVD and

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helicon wave plasma CVD within paragraph [0046] of the translation. With respect to claims 45 and 57, it is noted that the reference allows for the application of additional insulating layers (see paragraph [0046] of the translation) and that there is no specifically recited requirement for a densification step. Furthermore, applicants have failed to equate the disclosed act of annealing to the claimed "densifying". Lastly, it appears that paragraph [0046] of the translation allows for the use of CVD equipment that, according to applicants, deposits material densely that does not require a separate step of densification.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (571) 272-1079.

R. Sergent  
April 16, 2006

  
**RABON SERGENT**  
**PRIMARY EXAMINER**